Reduction of singularities of plane curves by birational transformation: PROFESSOR G. A. BLISS, University of Chicago, retiring president of the society.

The grafting of the theory of limits on the calculus of Leibniz: PROFESSOR FLORIAN CAJORI, University of California, representing the association.

Geometry and physics: PROFESSOR OSWALD VEBLEN, Princeton University, retiring vice-president of Section A of the American Association.

At the Friday morning session the following papers will be given:

Period of the bifilar pendulum for finite amplitudes: PROFESSOR H. S. UHLER, Yale University.

Skew squares: PROFESSOR W. H. ECHOLS, University of Virginia.

On the averaging of grades: PROFESSOR C. F. GUMMER, Queen's University.

Mathematics at Oxford and the Ph.D. degree: PROFESSOR W. R. BURWELL, Brown University.

Some unsolved problems in the theory of sampling: PROFESSOR B. H. CAMP, Wesleyan University.

Some unsolved problems in solid geometry: PROFESSOR J. L. COOLIDGE, Harvard University.

It is of special note that the session on Friday afternoon will be devoted to a "Symposium on Mathematical Statistics," for the purpose of strengthening the existing entente cordiale between mathematicians on the one hand and practicing statisticians on the other. It is hoped that this symposium will be of real service, not only to those who are giving courses in statistics in departments of mathematics, but also to others who may be interested in the application of mathematics to statistical problems. The following papers will be read:

The subject matter of a course in mathematical statistics: PROFESSOR H. L. RIETZ, head of the department of mathematics at the State University of Iowa, and chairman of the National Research Council's Committee on the Mathematical Analysis of Statistics.

Time series of economic statistics: their fluctuation and correlation: WARREN M. PERSONS, professor of economics at Harvard University, and editor of the *Review of Economic Statistics*, published by the Harvard Committee on Economic Research.

The fundamental concepts of the calculus of mass variation: ARNE FISHER, statistician of the American Telephone and Telegraph Company, and author of "The mathematical theory of probabilities and its application to frequency curves and statistical methods." The discussion will be opened by RAYMOND PEARL, professor of biometry and vital statistics in the School of Hygiene and Public Health, Johns Hopkins University, and statistician of the Johns Hopkins Hospital.

CHEMISTRY AT THE BOSTON MEETING OF THE AMERICAN ASSOCIATION

THE Boston meeting of the American Association for the Advancement of Science will undoubtedly be the most important to chemists of any of its meetings held for years. Papers on research work completed or in progress are now invited from the chemists of the country. In addition to such papers as may be submitted there will be a symposium on "The Progress of Chemistry," and a second symposium on "Photochemistry and Plant Physiology," in which the leading chemists of the country will discuss these subjects. In addition the American Physical Society will continue the series of symposia begun last year jointly with the Mathematica and Chemical Societies. The subject will be "Ionization Potentials and Atomic Radiation," and the speakers will be Paul D. Foote, K. T. Compton and Henry Norris Russell.

The following list gives the papers already arranged for in connection with the symposium on the progress of chemistry: "Compressibilities and the size of atoms," by Theodore W. Richards, of Harvard University; "Proteins and the theory of colloidal behavior," Jacques Loeb, of the Rockefeller Institute; "X-rays as related to the structure of atoms and of crystals," William Duane and also George L. Clark, both of Harvard University; "Changes in volume during the solution of solids," Gregory P. Baxter, of Harvard University; "The chemistry of the photographic process," C. E. K. Mees, of the Eastman Kodak Company; "The present status of the theory of complete ionization," D. A. MacInnes, of the Massachusetts Institute of Technology; "The present status of the theory of incomplete ionizaion," James Kendall, of Columbia University; "Ionization potentials and chemical action," W. A. Noyes, Jr., and "The separation

of isotopes," by R. S. Mulliken, both of the University of Chicago. In addition a number of other topics, not yet fully decided upon, will be discussed by noted chemists.

At the symposium on photochemistry and plant physiology to be held Thursday, December 28, at 2 p. m., H. A. Spoehr, of the Desert Laboratory, will discuss "Photosynthesis," S. E. Sheppard will speak on "Photochemical reactions," and a third speaker will present the subject "Carbohydrate metabolism."

The address of the retiring vice-president and chairman of Section C will be upon the subject "The nuclei of atoms and the general system of isotopes."

It is expected that one or two of the sessions will be provided with a program by nearby sections of the American Chemical Society as follows: the Northeastern, the New York, the Eastern New York, the Cornell, the New Haven, the Philadelphia, the Washington, and the Delaware sections.

Speakers have been invited to present papers on atomic structure, the electron theory of valence, the nature of metals, the work of various great laboratories, and various other topics of interest to professional chemists. It should be noted that no specific invitations have been sent out for papers on the research work of individuals, but it is hoped that the chemists of the United States and Canada will respond in considerable numbers to the general invitation given in the present notice. The titles of such papers should be sent as soon as possible either to the retiring chairman, Professor W. D. Harkins, of the University of Chicago, to the secretary of the Northeastern Section of the American Chemical Society, Professor E. B. Millard, of the Massachusetts Institute of Technology, Cambridge, Mass., or to the vice-president and chairman, Professor W. Lash Miller, of the University of Toronto.

SCIENTIFIC NOTES AND NEWS

AT the anniversary meeting of the Royal Society on November 30, its awards are to be conferred as follows: Royal medal to Professor C. T. R. Wilson, for his researches on condensation nuclei and atmospheric electricity, and to Professor J. Barcroft, for his researches in physiology, especially in respiration; the Copley medal to Sir Ernest Rutherford, for his researches in radioactivity and atomic structure; the Rumford medal to Professor Pieter Zeeman, for his researches in optics; the Davy medal to Professor J. F. Thorpe, for his researches in synthetic organic chemistry; the Darwin medal to Professor R. C. Punnett, for his researches in the science of genetics; the Buchanan medal to Sir David Bruce, for his researches and discoveries in tropical medicine; the Sylvester medal to Professor T. Levi-Civita, for his researches in geometry and mechanics; and the Hughes medal to Dr. F. W. Aston, for his discovery of isotopes by the method of positive rays.

AT the formal opening of the University of Paris, honorary degrees of doctor of laws were received by Ambassador Herrick on behalf of Elihu Root, Esq., Dr. A. Lawrence Lowell, president of Harvard University, and Professor Albert A. Michelson, of the University of Chicago.

DR. M. C. WHITAKER, chemical engineer of New York City, has been awarded the Perkin medal "for the most important contribution to applied chemistry made by any citizen of the United States," by the Society of Chemical Industry. The presentation will be made by Dr. Charles F. Chandler.

AT the meeting of the Ophthalmic Section of the American Medical Association, Dr. Frederick H. Verhoeff, of Boston, was awarded the Knapp Medal for his paper on "Ghoinas of the Optic Nerve." Dr. Verhoeff is president of the New England Ophthalmological Society.

THE British Institution of Mining Engineers has awarded its medal to Sir George Beilby, "in recognition of his valuable contributions to science, with special reference to his researches on fuel."

MR. R. T. A. INNES, the union astronomer at Johannesburg, has received the degree of doctor of science from the University of Leyden.